

Configurando VPN MPLS sobre ATM com roteadores Cisco 7500 e Switches LightStream 1010

Contents

[Introduction](#)

[Prerequisites](#)

[Requirements](#)

[Conventions](#)

[Configurar](#)

[Diagrama de Rede](#)

[Descrição da rede](#)

[Configurações](#)

[Informações Relacionadas](#)

[Introduction](#)

Este documento mostra como configurar o Multiprotocol Label Switching (MPLS) da Virtual Private Network (VPN) em Modo de Transferência Assíncrona (Asynchronous Transfer Mode) com roteadores Cisco 7500 como Label Edge Routers (LERs) e roteadores LightStream 1010 como Label Switch Routers (LSRs). Dois roteadores conectados por Ethernet, cada um em um site de cliente remoto, são parte de uma VPN. Neste documento, observamos as configurações de dispositivo fim-a-fim e os comandos show úteis.

[Prerequisites](#)

[Requirements](#)

Não existem requisitos específicos para este documento.

[Conventions](#)

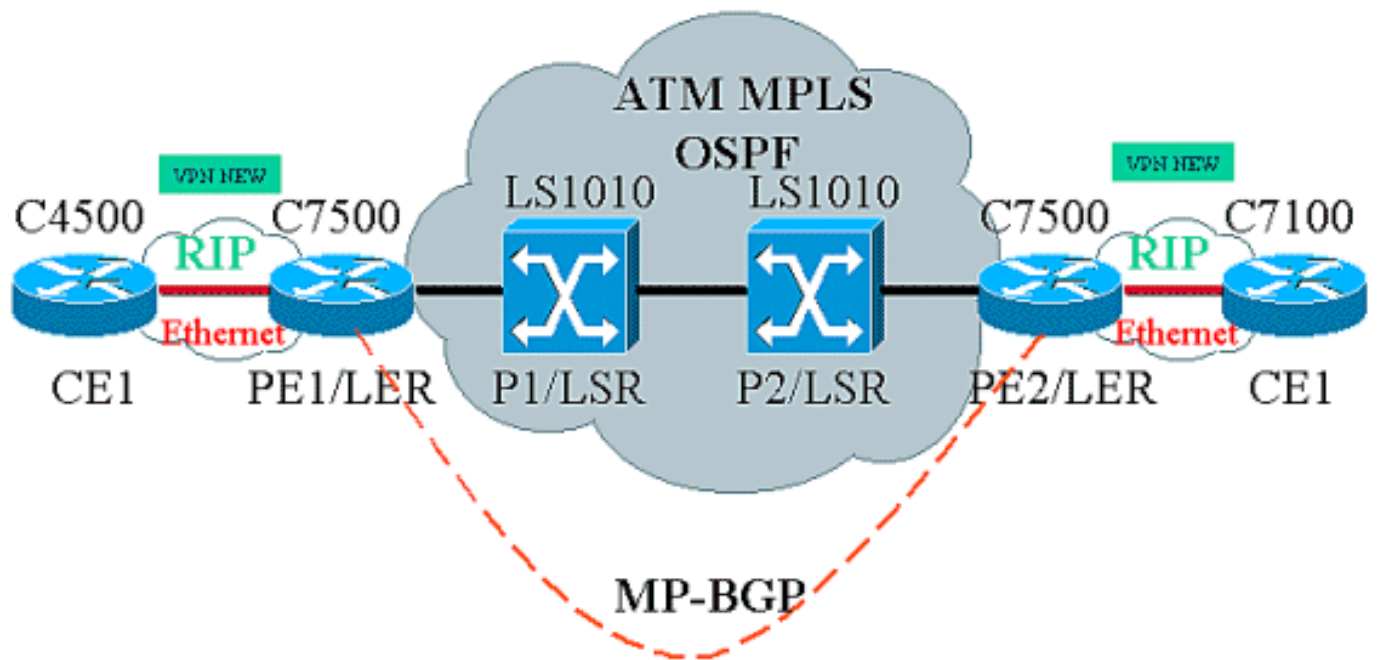
Consulte as [Convenções de Dicas Técnicas da Cisco para obter mais informações sobre convenções de documentos](#).

[Configurar](#)

Nesta seção, você encontrará informações para configurar os recursos descritos neste documento.

Diagrama de Rede

Este documento utiliza a seguinte configuração de rede:



Descrição da rede

A configuração atual contém estes elementos na terminologia de VPN:

- CE = roteador de borda do cliente
- PE = Roteador de Borda do Provedor
- P=Roteador do provedor

A configuração atual contém estes elementos na terminologia MPLS:

- LER = roteador de borda de rótulo
- LSR = roteador de switch de rótulo
- TDP/LDP = Tag Distribution Protocol/Label Distribution Protocol

Configurações

Este documento utiliza as seguintes configurações:

- PE1 e PE2 são os LERs em nossa rede ATM.
- P1 e P2 são os LSRs.
- CE1 e CE2 são roteadores de borda de cliente que não estão cientes e não executam VPN ou MPLS.
- CE1 e CE2 são Ethernet conectadas a PE1 e PE2, respectivamente, e executam o Routing Information Protocol (RIP).
- PE1, PE2, P1 e P2 fazem OSPF (Open Shortest Path First) e estão todos na área 0. O OSPF é o Interior Gateway Protocol (IGP) usado na rede ATM. A comutação de tag é usada nas interfaces ATM em todos os quatro dispositivos ATM. O TDP (Tag Distribution Protocol

Protocolo de Distribuição de Marcas) atribui Marcas às rotas OSPF.

- PE1 e PE2 são peers do Multiprotocol-Border Gateway Protocol (MP-BGP).
- As rotas RIP são redistribuídas em MP-BGP. Rotas MP-BGP redistribuídas em RIP nos roteadores PE1 e PE2.
- A configuração mantém tabelas de roteamento VRF separadas nos roteadores PE1 e PE2.
- O nome da VPN usada neste exemplo é NOVO.

CE1

```
!  
version 12.1  
service timestamps debug datetime msec  
service timestamps log datetime msec  
  
!  
boot system flashow c4500-js-mz.121-5  
!  
  
ip subnet-zero  
  
!  
interface Loopback0  
 ip address 10.1.1.1 255.255.255.0  
!  
interface Loopback1  
 ip address 10.2.2.2 255.255.255.0  
!  
interface Loopback2  
 ip address 10.3.3.3 255.255.255.0  
!  
interface Ethernet0  
 ip address 100.1.1.2 255.255.255.0  
 media-type 10BaseT  
  
!  
  
router rip  
 version 2  
 network 10.0.0.0  
 network 100.0.0.0  
 no auto-summary  
!  
ip classless  
!
```

PE1

```
!  
version 12.1  
  
service timestamps debug uptime  
service timestamps log uptime  
  
!  
boot system flashow slot1:rsp-jsv-mz.121-5a.bin  
!  
  
ip subnet-zero  
  
!  
ip vrf NEW
```

```
rd 200:1
route-target export 200:1
route-target import 200:1
ip cef distributed

!
interface Loopback0
 ip address 1.1.1.1 255.255.255.255
!
interface ATM2/0/0
 mtu 1500
 no ip address
!
interface ATM2/0/0.10 tag-switching
 ip unnumbered Loopback0
 tag-switching ip
!
interface Ethernet2/1/0
 ip vrf forwarding NEW
 ip address 100.1.1.1 255.255.255.0

!
router ospf 100
 no log-adjacency-changes
 network 1.0.0.0 0.255.255.255 area 0
 network 100.1.1.0 0.0.0.255 area 0
!
router rip
 version 2
 network 100.0.0.0
 no auto-summary
!
 address-family ipv4 vrf NEW
 version 2
 redistribute bgp 200 metric 0
 network 100.0.0.0
 no auto-summary
 exit-address-family
!
router bgp 200
 bgp log-neighbor-changes
 neighbor 2.2.2.2 remote-as 200

 neighbor 2.2.2.2 update-source Loopback0
 no auto-summary
!
 address-family ipv4 vrf NEW
 redistribute rip
 no auto-summary
 no synchronization
 exit-address-family
!
 address-family vpnv4
 neighbor 2.2.2.2 activate
 neighbor 2.2.2.2 send-community extended
 no auto-summary
 exit-address-family
!
ip classless
!
```

P1

```
!  
service timestamps debug uptime  
service timestamps log uptime  
!  
ip subnet-zero  
!  
interface Loopback0  
 ip address 4.4.4.4 255.255.255.255  
 no ip directed-broadcast  
!  
interface ATM12/0/0  
 ip unnumbered Loopback0  
 no ip directed-broadcast  
  
 tag-switching ip  
!  
interface ATM12/0/1  
 ip unnumbered Loopback0  
 no ip directed-broadcast  
  
 tag-switching ip  
  
!  
router ospf 100  
 network 4.0.0.0 0.255.255.255 area 0  
!  
ip classless  
!
```

P2

```
!  
service timestamps debug uptime  
service timestamps log uptime  
!  
ip subnet-zero  
!  
interface Loopback0  
 ip address 3.3.3.3 255.255.255.255  
 no ip directed-broadcast  
!  
interface ATM0/1/1  
 ip unnumbered Loopback0  
 no ip directed-broadcast  
  
 tag-switching ip  
!  
interface ATM0/1/3  
 ip unnumbered Loopback0  
 no ip directed-broadcast  
  
 tag-switching ip  
  
!  
router ospf 100  
 network 3.0.0.0 0.255.255.255 area 0  
!  
ip classless
```

```
!
```

PE2

```
!  
version 12.1  
service timestamps debug datetime msec  
service timestamps log datetime msec  
  
!  
boot system flashw slot0:rsp-jsv-mz.121-5a  
!  
ip subnet-zero  
  
!  
ip vrf NEW  
  rd 200:1  
  route-target export 200:1  
  route-target import 200:1  
ip cef distributed  
  
!  
interface Loopback0  
  ip address 2.2.2.2 255.255.255.255  
!  
  
interface FastEthernet3/0/0  
  ip vrf forwarding NEW  
  ip address 110.1.1.1 255.255.255.0  
  
  half-duplex  
!  
  
interface ATM3/1/0.1 tag-switching  
  ip unnumbered Loopback0  
  tag-switching ip  
!  
router ospf 100  
  log-adjacency-changes  
  network 2.0.0.0 0.255.255.255 area 0  
  
!  
router rip  
  version 2  
  network 110.0.0.0  
  no auto-summary  
  !  
  address-family ipv4 vrf NEW  
  version 2  
  redistribute bgp 200 metric 0  
  network 110.0.0.0  
  no auto-summary  
  exit-address-family  
  !  
router bgp 200  
  bgp log-neighbor-changes  
  neighbor 1.1.1.1 remote-as 200  
  
  neighbor 1.1.1.1 update-source Loopback0  
  
  no auto-summary  
  !
```

```
address-family ipv4 vrf NEW
redistribute rip
no auto-summary
no synchronization
exit-address-family
!
address-family vpv4
neighbor 1.1.1.1 activate
neighbor 1.1.1.1 send-community extended
no auto-summary
exit-address-family
!
ip classless
!
```

CE2

```
!
version 12.1

service timestamps debug uptime
service timestamps log uptime

!

boot system disk0:c7100-jo3s56i-mz.121-5.T.bin

!
ip subnet-zero

!
interface Loopback0
 ip address 30.1.1.1 255.255.255.0
!
interface Loopback1
 ip address 30.2.2.2 255.255.255.0
!
interface Loopback2
 ip address 30.3.3.3 255.255.255.0
!
interface FastEthernet0/0
 ip address 110.1.1.2 255.255.255.0

!
router rip
 version 2
 network 30.0.0.0
 network 110.0.0.0
 no auto-summary
!
```

comandos show

Use esses comandos para testar se a rede funciona adequadamente:

- **show ip route** - Exibe entradas de tabela de IP Routing.
- **show ip vrf** de banco de dados ip rip – Exibe informações contidas no banco de dados RIP para um determinado VRF.
- **show ip bgp vpv4 vrf** – Exibe informações do endereço VPN da tabela BGP.
- **show tag-switching interfaces detail** - Exibe informações sobre uma ou mais interfaces que têm o recurso MPLS ativado.

- **show tag-switching tdp bindings** - Exibe as entradas solicitadas do banco de dados de vinculação de rótulo LDP ATM.
- **show tag-switching forwarding-table vrf** - Verifica a pilha de rótulos usada para uma rota específica.

A saída mostrada abaixo é um resultado desses comandos inseridos nos dispositivos mostrados no diagrama de rede. Esta saída mostra que a rede está funcionando adequadamente.

CE1

```
Cisco4500#show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route
```

```
Gateway of last resort is not set
```

```

100.0.0.0/24 is subnetted, 1 subnets
C      100.1.1.0 is directly connected, Ethernet0
110.0.0.0/24 is subnetted, 1 subnets
R      110.1.1.0 [120/1] via 100.1.1.1, 00:00:14, Ethernet0
10.0.0.0/24 is subnetted, 3 subnets
C      10.3.3.0 is directly connected, Loopback2
C      10.2.2.0 is directly connected, Loopback1
C      10.1.1.0 is directly connected, Loopback0
30.0.0.0/24 is subnetted, 3 subnets
R      30.3.3.0 [120/1] via 100.1.1.1, 00:00:14, Ethernet0
R      30.2.2.0 [120/1] via 100.1.1.1, 00:00:15, Ethernet0
R      30.1.1.0 [120/1] via 100.1.1.1, 00:00:15, Ethernet0
```

PE1

```
Cisco7500a#show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route
```

```
Gateway of last resort is not set
```

```

1.0.0.0/32 is subnetted, 1 subnets
C      1.1.1.1 is directly connected, Loopback0
2.0.0.0/32 is subnetted, 1 subnets
O      2.2.2.2 [110/4] via 4.4.4.4, 18:17:37, ATM2/0/0.10
3.0.0.0/32 is subnetted, 1 subnets
O      3.3.3.3 [110/3] via 4.4.4.4, 18:17:37, ATM2/0/0.10
4.0.0.0/32 is subnetted, 1 subnets
O      4.4.4.4 [110/2] via 4.4.4.4, 18:17:37, ATM2/0/0.10
```

```
Cisco7500a#show ip route vrf NEW
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
```


N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

```
100.0.0.0/24 is subnetted, 1 subnets
C    100.1.1.0 is directly connected, Ethernet2/1/0
110.0.0.0/24 is subnetted, 1 subnets
B    110.1.1.0 [200/0] via 2.2.2.2, 00:26:11
10.0.0.0/24 is subnetted, 3 subnets
R    10.3.3.0 [120/1] via 100.1.1.2, 00:00:11, Ethernet2/1/0
R    10.2.2.0 [120/1] via 100.1.1.2, 00:00:11, Ethernet2/1/0
R    10.1.1.0 [120/1] via 100.1.1.2, 00:00:11, Ethernet2/1/0
30.0.0.0/24 is subnetted, 3 subnets
B    30.3.3.0 [200/1] via 2.2.2.2, 00:26:12
B    30.2.2.0 [200/1] via 2.2.2.2, 00:26:12
B    30.1.1.0 [200/1] via 2.2.2.2, 00:26:12
```

Cisco7500a#show ip rip database vrf NEW

```
10.0.0.0/8    auto-summary
10.1.1.0/24
    [1] via 100.1.1.2, 00:00:18, Ethernet2/1/0
10.2.2.0/24
    [1] via 100.1.1.2, 00:00:18, Ethernet2/1/0
10.3.3.0/24
    [1] via 100.1.1.2, 00:00:18, Ethernet2/1/0
30.0.0.0/8    auto-summary
30.1.1.0/24   redistributed
    [1] via 2.2.2.2,
30.2.2.0/24   redistributed
    [1] via 2.2.2.2,
30.3.3.0/24   redistributed
    [1] via 2.2.2.2,
100.0.0.0/8   auto-summary
100.1.1.0/24  directly connected, Ethernet2/1/0
110.0.0.0/8   auto-summary
110.1.1.0/24  redistributed
    [1] via 2.2.2.2,
```

Cisco7500a#show ip bgp vpnv4 vrf NEW

BGP table version is 17, local router ID is 1.1.1.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 200:1 (default for vrf NEW)					
*> 10.1.1.0/24	100.1.1.2	1		32768	?
*> 10.2.2.0/24	100.1.1.2	1		32768	?
*> 10.3.3.0/24	100.1.1.2	1		32768	?
*>i30.1.1.0/24	2.2.2.2	1	100	0	?
*>i30.2.2.0/24	2.2.2.2	1	100	0	?
*>i30.3.3.0/24	2.2.2.2	1	100	0	?
*> 100.1.1.0/24	0.0.0.0	0		32768	?
*>i110.1.1.0/24	2.2.2.2	0	100	0	?

Cisco7500a#show tag-switching interfaces

Interface	IP	Tunnel	Operational	
ATM2/0/0.10	Yes	No	Yes	(ATM tagging)

Cisco7500a#show tag-switching interfaces detail

Interface ATM2/0/0.10:

IP tagging enabled
TSP Tunnel tagging not enabled
Tagging operational
Tagswitching turbo vector
MTU = 4470
ATM tagging:
 Tag VPI = 1
 Tag VCI range = 33 - 65535
 Control VC = 0/32

Cisco7500a#**show tag-switching ?**

atm-tdp ATM Tagging Protocol information
cos-map Show Tag CoS ATM Multi-VC CoS Map
forwarding-table Show the Tag Forwarding Information Base (TFIB)
interfaces Show per-interface tag switching
prefix-map Show Tag CoS Prefix Map
tdp Tag Distribution Protocol information

Cisco7500a#**show tag-switching tdp bindings**

tib entry: 1.1.1.1/32, rev 2
 local binding: tag: imp-null
tib entry: 2.2.2.2/32, rev 23
 local binding: tag: 27
tib entry: 3.3.3.3/32, rev 21
 local binding: tag: 26
tib entry: 4.4.4.4/32, rev 10
 local binding: tag: 28

Cisco7500a#**show tag-switching atm-tdp bindings**

Destination: 4.4.4.4/32
 Headend Router ATM2/0/0.10 (1 hop) 1/33 Active, VCD=24
Destination: 3.3.3.3/32
 Headend Router ATM2/0/0.10 (2 hops) 1/43 Active, VCD=25
Destination: 2.2.2.2/32
 Headend Router ATM2/0/0.10 (3 hops) 1/42 Active, VCD=26
Destination: 1.1.1.1/32
 Tailend Router ATM2/0/0.10 1/33 Active, VCD=24

Cisco7500a#**show tag-switching forwarding-table vrf NEW**

Local tag	Outgoing tag or VC	Prefix or Tunnel Id	Bytes tag switched	Outgoing interface	Next Hop
29	Aggregate	100.1.1.0/24[V]	2080		
30	Untagged	10.3.3.0/24[V]	0	Et2/1/0	100.1.1.2
31	Untagged	10.2.2.0/24[V]	0	Et2/1/0	100.1.1.2
32	Untagged	10.1.1.0/24[V]	0	Et2/1/0	100.1.1.2

P1

LS1010#**show ip route**

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
U - per-user static route, o - ODR
T - traffic engineered route

Gateway of last resort is not set

1.0.0.0/32 is subnetted, 1 subnets
O 1.1.1.1 [110/2] via 1.1.1.1, 19:00:12, ATM12/0/0

```
    2.0.0.0/32 is subnetted, 1 subnets
O    2.2.2.2 [110/3] via 3.3.3.3, 19:00:12, ATM12/0/1
    3.0.0.0/32 is subnetted, 1 subnets
O    3.3.3.3 [110/2] via 3.3.3.3, 19:00:12, ATM12/0/1
    4.0.0.0/32 is subnetted, 1 subnets
C    4.4.4.4 is directly connected, Loopback0
```

LS1010#show tag-switching atm-tdp bindings

```
Destination: 4.4.4.4/32
    Tailend Switch ATM12/0/0 1/33 Active -> Terminating Active
    Tailend Switch ATM12/0/1 1/34 Active -> Terminating Active
Destination: 2.2.2.2/32
    Transit ATM12/0/0 1/42 Active -> ATM12/0/1 1/35 Active
Destination: 1.1.1.1/32
    Transit ATM12/0/1 1/33 Active -> ATM12/0/0 1/33 Active
Destination: 3.3.3.3/32
    Transit ATM12/0/0 1/43 Active -> ATM12/0/1 1/34 Active
```

P2

LS1010#show ip route

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
        U - per-user static route, o - ODR
```

Gateway of last resort is 10.118.1.21 to network 0.0.0.0

```
    1.0.0.0/32 is subnetted, 1 subnets
O    1.1.1.1 [110/3] via 4.4.4.4, 19:46:00, ATM0/1/1
    2.0.0.0/32 is subnetted, 1 subnets
O    2.2.2.2 [110/2] via 2.2.2.2, 19:46:00, ATM0/1/3
    3.0.0.0/32 is subnetted, 1 subnets
C    3.3.3.3 is directly connected, Loopback0
    4.0.0.0/32 is subnetted, 1 subnets
O    4.4.4.4 [110/2] via 4.4.4.4, 19:46:00, ATM0/1/1
    10.0.0.0/24 is subnetted, 1 subnets
C    10.118.1.0 is directly connected, Ethernet2/0/0
S*   0.0.0.0/0 [1/0] via 10.118.1.21
```

LS1010#show tag-switching atm-tdp bindings

```
Destination: 1.1.1.1/32
    Transit ATM0/1/3 1/33 Active -> ATM0/1/1 1/33 Active
Destination: 3.3.3.3/32
    Tailend Switch ATM0/1/3 1/34 Active -> Terminating Active
    Tailend Switch ATM0/1/1 1/34 Active -> Terminating Active
Destination: 4.4.4.4/32
    Transit ATM0/1/3 1/35 Active -> ATM0/1/1 1/34 Active
Destination: 2.2.2.2/32
    Transit ATM0/1/1 1/35 Active -> ATM0/1/3 1/33 Active
```

PE2

Cisco7500#show ip route

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
```

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

```
1.0.0.0/32 is subnetted, 1 subnets
O   1.1.1.1 [110/4] via 3.3.3.3, 02:58:46, ATM3/1/0.1
2.0.0.0/32 is subnetted, 1 subnets
C   2.2.2.2 is directly connected, Loopback0
3.0.0.0/32 is subnetted, 1 subnets
O   3.3.3.3 [110/2] via 3.3.3.3, 02:58:46, ATM3/1/0.1
4.0.0.0/32 is subnetted, 1 subnets
O   4.4.4.4 [110/3] via 3.3.3.3, 02:58:46, ATM3/1/0.1
```

Cisco7500#show ip route vrf NEW

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

```
100.0.0.0/24 is subnetted, 1 subnets
B   100.1.1.0 [200/0] via 1.1.1.1, 01:16:13
110.0.0.0/24 is subnetted, 1 subnets
C   110.1.1.0 is directly connected, FastEthernet3/0/0
10.0.0.0/24 is subnetted, 3 subnets
B   10.3.3.0 [200/1] via 1.1.1.1, 01:16:13
B   10.2.2.0 [200/1] via 1.1.1.1, 01:16:13
B   10.1.1.0 [200/1] via 1.1.1.1, 01:16:13
30.0.0.0/24 is subnetted, 3 subnets
R   30.3.3.0 [120/1] via 110.1.1.2, 00:00:16, FastEthernet3/0/0
R   30.2.2.0 [120/1] via 110.1.1.2, 00:00:17, FastEthernet3/0/0
R   30.1.1.0 [120/1] via 110.1.1.2, 00:00:17, FastEthernet3/0/0
```

Cisco7500#show ip rip database vrf NEW

```
10.0.0.0/8    auto-summary
10.1.1.0/24   redistributed
              [1] via 1.1.1.1,
10.2.2.0/24   redistributed
              [1] via 1.1.1.1,
10.3.3.0/24   redistributed
              [1] via 1.1.1.1,
30.0.0.0/8    auto-summary
30.1.1.0/24
              [1] via 110.1.1.2, 00:00:09, FastEthernet3/0/0
30.2.2.0/24
              [1] via 110.1.1.2, 00:00:09, FastEthernet3/0/0
30.3.3.0/24
              [1] via 110.1.1.2, 00:00:09, FastEthernet3/0/0
100.0.0.0/8   auto-summary
100.1.1.0/24  redistributed
              [1] via 1.1.1.1,
110.0.0.0/8   auto-summary
110.1.1.0/24  directly connected, FastEthernet3/0/0
```

Cisco7500#show ip bgp vpnv4 vrf NEW

BGP table version is 17, local router ID is 2.2.2.2

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 200:1 (default for vrf NEW)					
*>i10.1.1.0/24	1.1.1.1	1	100	0	?
*>i10.2.2.0/24	1.1.1.1	1	100	0	?
*>i10.3.3.0/24	1.1.1.1	1	100	0	?
*> 30.1.1.0/24	110.1.1.2	1		32768	?
*> 30.2.2.0/24	110.1.1.2	1		32768	?
*> 30.3.3.0/24	110.1.1.2	1		32768	?
*>i100.1.1.0/24	1.1.1.1	0	100	0	?
*> 110.1.1.0/24	0.0.0.0	0		32768	?

Cisco7500#show tag-switching interfaces

Interface	IP	Tunnel	Operational	
ATM3/1/0.1	Yes	No	Yes	(ATM tagging)

Cisco7500#show tag-switching interfaces detail

```
Interface ATM3/1/0.1:
  IP tagging enabled
  TSP Tunnel tagging not enabled
  Tagging operational
  Tagswitching turbo vector
  MTU = 4470
  ATM tagging:
    Tag VPI = 1
    Tag VCI range = 33 - 65535
    Control VC = 0/32
```

Cisco7500#show tag-switching ?

```
atm-tdp      ATM Tagging Protocol information
cos-map      Show Tag CoS ATM Multi-VC CoS Map
forwarding-table Show the Tag Forwarding Information Base (TFIB)
interfaces   Show per-interface tag switching
prefix-map   Show Tag CoS Prefix Map
tdp         Tag Distribution Protocol information
```

Cisco7500#show tag-switching tdp bindings

```
tib entry: 1.1.1.1/32, rev 25
  local binding: tag: 26
tib entry: 2.2.2.2/32, rev 2
  local binding: tag: imp-null
tib entry: 3.3.3.3/32, rev 27
  local binding: tag: 27
tib entry: 4.4.4.4/32, rev 29
  local binding: tag: 28
```

Cisco7500#show tag-switching atm-tdp bindings

```
Destination: 1.1.1.1/32
  Headend Router ATM3/1/0.1 (3 hops) 1/33 Active, VCD=8
Destination: 3.3.3.3/32
  Headend Router ATM3/1/0.1 (1 hop) 1/34 Active, VCD=6
Destination: 4.4.4.4/32
  Headend Router ATM3/1/0.1 (2 hops) 1/35 Active, VCD=7
Destination: 2.2.2.2/32
  Tailend Router ATM3/1/0.1 1/33 Active, VCD=8
```

Cisco7500#show tag-switching forwarding-table vrf NEW

Local tag	Outgoing tag or VC	Prefix or Tunnel Id	Bytes tag switched	Outgoing interface	Next Hop
33	Aggregate	110.1.1.0/24[V]	0		
34	Untagged	30.3.3.0/24[V]	0	Fa3/0/0	110.1.1.2
35	Untagged	30.2.2.0/24[V]	0	Fa3/0/0	110.1.1.2
36	Untagged	30.1.1.0/24[V]	0	Fa3/0/0	110.1.1.2

CE2

```
Cisco7100#show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP  
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP  
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area  
* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route
```

```
Gateway of last resort is not set
```

```
100.0.0.0/24 is subnetted, 1 subnets  
R    100.1.1.0 [120/1] via 110.1.1.1, 00:00:19, FastEthernet0/0  
110.0.0.0/24 is subnetted, 1 subnets  
C    110.1.1.0 is directly connected, FastEthernet0/0  
10.0.0.0/24 is subnetted, 3 subnets  
R    10.3.3.0 [120/1] via 110.1.1.1, 00:00:19, FastEthernet0/0  
R    10.2.2.0 [120/1] via 110.1.1.1, 00:00:19, FastEthernet0/0  
R    10.1.1.0 [120/1] via 110.1.1.1, 00:00:19, FastEthernet0/0  
30.0.0.0/24 is subnetted, 3 subnets  
C    30.3.3.0 is directly connected, Loopback2  
C    30.2.2.0 is directly connected, Loopback1  
C    30.1.1.0 is directly connected, Loopback0
```

[Informações Relacionadas](#)

- [Virtual Private Networks de MPLS](#)
- [Configurando uma VPN MPLS básica](#)
- [Fluxo de pacote em um ambiente de MPLS VPN](#)
- [Suporte Técnico e Documentação - Cisco Systems](#)